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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/967,208

09/28/2001

Mithat C. Dogan

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11/15/2006

ARRAYCOMM/BLAKELY

12400 WILSHIRE BLVD

SEVENTH FLOOR

LOS ANGELES, CA 90025-1030

EXAMINER

MALEK, LEILA

ART UNIT

PAPER NUMBER

2611

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/967,208	Applicant(s) DOGAN ET-AL.	
	Examiner Leila Malek	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-13 and 18-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-13 and 18-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09/28/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the invention is more than 150 words. Appropriate action is required.

Claim Objections

3. Claim 9 is objected to because of the following informalities: As to claim 9, applicant claims that the modifying sequence comprises pairs of equal complex numbers, such that each complex number pair is equal to the previous complex number pair multiplied by $\exp(j2\pi/M)$, however this is inconsistent with the value disclosed on page 19, line 1 (i.e. $\exp(2\pi/M)$) of the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Art Unit: 2611

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 3-13, and 18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter, because as a whole it does not accomplish a practical application. In order to accomplish a practical application, it must produce a "useful, concrete and tangible result." (see MPEP 2106, under section II, Determine What Applicant Has Invented and is Seeking to Patent, subsection A, Identify and Understand Any Practical Application Asserted for the Invention.). Applicant in claim 1 does not cite any use for the generated training signal. Therefore the claim lacks practical application.

Claims 22-25 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter, because as a whole it does not accomplish a practical application. In order to accomplish a practical application, it must produce a "useful, concrete and tangible result." (see MPEP 2106, under section II, Determine What Applicant Has Invented and is Seeking to Patent, subsection A, Identify and Understand Any Practical Application Asserted for the Invention.). Applicant in claim 22 recites "a computer-readable medium having instructions". Word "having" in this claim is ambiguous. Examiner suggests the use of "a computer readable medium encoded with computer executable instructions" instead.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2611

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 6-8, 10-12, 18, 22, and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Shattil (US 2004/0141548)

As to claim 1, Shattil discloses a method comprising: selecting a set of original ordered sequences having at least one desired property (low peak to average power ratio has been interpreted as a desired property) (see paragraphs 0123 and claim 9); creating a set of extended sequences, each based on an original ordered sequence of the set of ordered sequences by beginning with an element of the original ordered sequence, cyclically appending elements of the original ordered sequence in order to obtain a desired sequence length comprising at least one subsequence (see paragraphs 0067 and 0082); and modifying each extended sequence using a corresponding modifying sequence (shaping of the prefix and postfix has been interpreted as modifying the sequence) (see paragraphs 0014 and 0082-0083); such that a training sequence may be generated from any one of the modified extended sequences by beginning with first element of a subsequence of the any one modified extended sequence and taking each element of the sequence in order to obtain the training sequence (see paragraph 0067), the modifying sequence being selected so that the obtained training sequence when modulated by a selected modulation format has the at least one desired property of the corresponding original ordered sequence (see paragraphs 0003, 0012, 0018, 0067 and 0117).

As to claim 6, Shattil discloses that the original sequence comprises a sequence of complex numbers (see paragraph 0058) corresponding to phase shifts employed by the modulation format used to transmit the training sequence (see paragraphs 0059 and 0087).

As to claim 7, Shattil discloses that the modifying sequence comprises a sequence of complex numbers (see paragraph 0058), and forming the modified extended sequence comprises multiplying each element of the extended sequence by a corresponding element of the modifying sequence (see paragraph 0179).

As to claim 8, Shattil further discloses that the modulation format is a Π /M-MPSK modulation format (see paragraph 0090).

As to claim 10, Shattil further discloses that the modulation format is a Π /M-MPSK (e.g. M could be 2) modulation format (see paragraph 0090).

As to claim 11, Shattil further discloses that the original sequence comprises a sequence of binary symbols (see paragraph 0058).

As to claim 12, Shattil discloses that the modifying sequence performs a binary complement operation on every other pair of elements of the extended sequence (see paragraphs 0058 and 0179).

As to claims 18, Shattil discloses that prefix and suffix have been added to the original sequence (see paragraph 0082); therefore the subsequence has a length greater than the original sequence.

As to claim 22, Shattil discloses an apparatus comprising instructions to cause a processing system to: select a set of original ordered sequences that set of ordered

Art Unit: 2611

sequences having at least one desired property (low peak to average power ratio has been interpreted as a desired property) (see paragraphs 0123 and claim 9); modify each original ordered sequence of the set of ordered sequences using a corresponding modifying sequence (shaping of the prefix and postfix has been interpreted as modifying the sequence) (see paragraphs 0014 and 0082-0083) to obtain a set of training sequences (see paragraph 0067), such that the obtained training sequences when modulated by a selected modulation format have the at least one desired property of the corresponding original ordered sequence (see paragraphs 0003, 0012, 0018, 0067 and 0117).

As to claim 25, Shattil discloses that the modifying sequence comprises a sequence of complex numbers (see paragraph 0058), and forming the modified extended sequence comprises multiplying each element of the extended sequence by a corresponding element of the modifying sequence (see paragraph 0179).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 4, 5, 13, 19, 20, 21, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shattil in view of Engstrom et al. (hereafter, referred as Engstrom) (US 5,909,436).

As to claim 3, Shattil discloses all the subject matters claimed in claim 1, except that the one desired property comprises a function of the autocorrelation of any original ordered sequence being below a threshold. Engstrom, in the same field of endeavor, discloses a random access protocol in OFDM systems wherein the mobile station transmits a known signal (interpreted as the training signal) sequence to a base station (see column 1, last paragraph). Engstrom further discloses that the known sequence could be a gold sequence (see column 6, lines 17 and 18) (which inherently has a low autocorrelation (interpreted as below a threshold)). It would have been obvious to one of ordinary skill in the art at the time of invention to use a gold code as the training sequence in OFDM systems to make it more distinguishable to the receiver.

As to claim 4, Shattil discloses all the subject matters claimed in claim 1, except that the original ordered sequences has a cross-correlation property. Engstrom discloses a random access protocol in OFDM systems wherein the mobile station transmits a known signal (interpreted as the training signal) sequence to a base station (see column 1, last paragraph). Engstrom further discloses that the known sequence could be a gold sequence (see column 6, lines 17 and 18) which inherently has a low cross-correlation property. It would have been obvious to one of ordinary skill in the art at the time of invention to use a gold code as the training sequence in OFDM systems to make it more distinguishable to the receiver.

As to claim 5, Shattil discloses all the subject matters claimed in claim 1, except that the original ordered sequences has a low (interpreted as below a threshold)

cross-correlation property. Engstrom discloses a random access protocol in OFDM systems wherein the mobile station transmits a known signal (interpreted as the training signal) sequence to a base station (see column 1, last paragraph). Engstrom further discloses that the known sequence could be a gold sequence (see column 6, lines 17 and 18), which inherently has a low cross-correlation (interpreted as below a threshold) property. It would have been obvious to one of ordinary skill in the art at the time of invention to use a gold code as the training sequence in OFDM systems to make it more distinguishable to the receiver.

As to claim 13, Shattil discloses all the subject matters claimed in claim 1, except that selecting a set of original ordered sequence comprises selecting a family of Gold sequences. Engstrom, in the same field of endeavor, discloses a random access protocol in OFDM systems wherein the mobile station transmits a known signal (interpreted as the training signal) sequence to a base station (see column 1, last paragraph). Engstrom further discloses that the known sequence could be a gold sequence (see column 6, lines 17 and 18). It would have been obvious to one of ordinary skill in the art at the time of invention to use a gold code as the training sequence in OFDM systems to make it more distinguishable to the receiver.

As to claim 19, Shattil discloses an apparatus comprising a data store having stored therein a plurality of ordered sequences for use in generating a training sequence (see paragraph 0186); and a processor to generate the training sequence by taking and modifying a number of elements of one of the plurality of ordered sequences (see Fig. 12, blocks 1210 and 1212). Shattil discloses all the subject

matters claimed in claim 19, except that a function of an autocorrelation of the training sequence is below a threshold value. Engstrom, in the same field of endeavor, discloses a random access protocol in OFDM systems wherein the mobile station transmits a known signal (interpreted as the training signal) sequence to a base station (see column 1, last paragraph). Engstrom further discloses that the known sequence could be a gold sequence (see column 6, lines 17 and 18) (which inherently has a low autocorrelation (interpreted as below a threshold)). It would have been obvious to one of ordinary skill in the art at the time of invention to use a gold code as the training sequence in OFDM systems to make it more distinguishable to the receiver.

As to claim 20, Engstrom further discloses that cross correlation of the two gold sequences (interpreted as training sequences) is below a threshold value (see column 6, lines 17 and 18).

As to claim 21, Shattil further discloses cyclically appending elements of the original ordered sequence (e.g. the prefix) in order to obtain a desired sequence length comprising at least one subsequence (see paragraphs 0067 and 0082).

As to claim 23, Shattil discloses all the subject matters claimed in claim 22, except that the one desired property comprises a function of the autocorrelation of any original ordered sequence being below a threshold. Engstrom, in the same field of endeavor, discloses a random access protocol in OFDM systems wherein the mobile station transmits a known signal (interpreted as the training signal) sequence to a base station (see column 1, last paragraph). Engstrom further discloses that the

Art Unit: 2611

known sequence could be a gold sequence (see column 6, lines 17 and 18) (which inherently has a low autocorrelation (interpreted as below a threshold)). It would have been obvious to one of ordinary skill in the art at the time of invention to use a gold code as the training sequence in OFDM systems to make it more distinguishable to the receiver.

As to claim 24, Shattil discloses all the subject matters claimed in claim 22, except that the original ordered sequences has a low (interpreted as below a threshold) cross-correlation property. Engstrom discloses a random access protocol in OFDM systems wherein the mobile station transmits a known signal (interpreted as the training signal) sequence to a base station (see column 1, last paragraph).. Engstrom further discloses that the known sequence could be a gold sequence (see column 6, lines 17 and 18) which inherently has a low cross-correlation (interpreted as below a threshold) property. It would have been obvious to one of ordinary skill in the art at the time of invention to use a gold code as the training sequence in OFDM systems to make it more distinguishable to the receiver.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leila Malek whose telephone number is 571-272-8731. The examiner can normally be reached on 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone

Art Unit: 2611

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Leila Malek
Examiner
Art Unit 2611

L.M


MOHAMMED GHATOUR
SUPERVISORY PATENT EXAMINER